sonal (P = 0.0034), and output demand (P = 0.0174) subscales. For the 150-mg group, the reduction in WLQ total index score approached significance (–2.9 [0.9]; P = 0.0545) and the mental-interpersonal improved significantly compared with placebo (P = 0.0057). **CONCLUSION:** Reductions in hot flush frequency and severity and improved sleep and mood are accompanied by significant improvement in work productivity in postmenopausal women treated with DVS.

WH4

ECONOMIC EVALUATION OF FEMALE VACCINATION WITH A QUADRIVALENT HUMAN PAPILLOMAVIRUS VACCINE IN NEW ZEALAND

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OBJECTIVES: To evaluate the cost-effectiveness and budget impact of vaccinating a single birth cohort of girls 11 years of age with Gardasil, a novel vaccine against human papilloma virus (HPV), in the presence of the current triennial cervical screening programme. **METHODS:** A lifetime Markov model of the incidence and prevalence of cervical dysplasia and cancer was constructed from New Zealand cervical cancer registrations and five-year survival plus the incidence of dysplasia estimated from analyses of screening histories of 28,000 women. Costs of dysplasia, cervical cancer and genital warts were obtained from local sources and health state utilities were taken from published sources. Efficacy was taken from several recent phase III clinical trials (FUTURE). The model was internally validated against the prevalence of dysplasia. **RESULTS:** Assuming lifetime protection and 79% uptake of 3 doses, HPV vaccination would prevent 140 cervical cancer cases and 42 deaths over the lifetime of the vaccinated cohort. At a unit vaccine price per dose of $NZ128.50 and 5% annual discount rate, the cost per QALY in the base case analysis is less than $NZ25,000 from either a health care or a Government perspective. The annual budget impact of vaccination for the Government is $NZ10.5M. Catch-up vaccination strategies for women age 12 to 26 y are more cost effective. These findings are sensitive to the reduction in quality of life that accompanies abnormal cytology or histology findings; vaccine efficacy; HPV genotype distribution; vaccine uptake and duration of protection. **CONCLUSION:** When a universal programme of HPV vaccination is added to current clinical screening and management of dysplasia and cervical cancer, over the lifetime of a birth cohort the cost required to provide each additional quality adjusted life year is very modest by international standards.

PODIUM SESSION II: MEDICATION ADHERENCE & OUTCOMES

AO1

MEDICATION COMPLIANCE TO STATIN THERAPY AND ITS IMPACT ON DISEASE OUTCOMES IN TYPE 2 DIABETES

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OBJECTIVES: To examine the incidence of statin initiation in patients with type 2 diabetes, medication compliance rates for both antidiabetic and statin therapies, and the impact of patient medication behavior on disease outcomes. **METHODS:** The California Medicaid program (Medi-Cal) claims data collected during the period of January 1995 to December 2004 was analyzed. A total of 4222 patients with type 2 diabetes were included in the study. Medication compliance was measured using Proportion of Days Covered (PDC) in each quarter of the study period. Descriptive analyses were performed to: 1) examine initiation of statin therapy and its change over time; and 2) compare long-term medication compliance to statin and to antidiabetic agents. A marginal structural model was employed to examine the impact of medication compliance to statin therapy on cardiovascular events. The effects of compliance on hospitalization and total medical costs were estimated by generalized estimating equations (GEE). **RESULTS:** Statin therapy was initiated by 2.71% of diabetic patients in 1996, rising to 18.08% in 2003. Medication compliance to statin therapy was high (PDC = 0.83, SD = 0.234) during the first quarter of statin treatment. However, patient compliance dropped sharply from the second quarter (PDC = 0.63, SD = 0.382) and the medication compliance at the end of the first year of the treatment was decreased to 0.56. Over the 30 quarters, patients were less likely to comply with statin therapy than with antidiabetic treatment (approximately 35% difference). Hispanic patients and patients with complicated medication regimens were more likely to exhibit poor compliance to statin therapy. Poor compliance to statin therapy was significantly associated with increased cardiovascular risk events ($p < 0.01$) and hospitalization in patients with type 2 diabetes ($p < 0.01$). **CONCLUSION:** Prescribing of statins in diabetic populations has improved in recent years, but long-term medication compliance to statin therapy and antidiabetic medications in the California Medicaid population remains problematic.

AO2

THE ASSOCIATION BETWEEN THERAPEUTIC PERSISTENCE AND NON-PHARMACY COST AMONG ANTI-TUMOR NECROSIS FACTORS (ANTI-TNFS) IN THE TREATMENT OF RHEUMATOID ARTHRITIS

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OBJECTIVES: To evaluate the impact of persistence with anti-TNF treatment on rheumatoid arthritis (RA)-related health care costs among RA patients. **METHODS:** A retrospective study, utilizing the PharMetrics managed-care claims database, was conducted. The first anti-TNF (infliximab, etanercept, or adalimumab) plus methotrexate encounter among RA patients between January 1, 2001 and January 1, 2004 was identified. Patients were required to have a minimum of 12-months of continuous plan eligibility prior to and following their index biologic date. Persistence (%) was defined as the number of days between their first biologic prescription and the last biologic encounter, divided by 365 and multiplied by 100. Two mutually exclusive cohorts were developed based on their level of anti-TNF persistence: individuals who were persistent ≥80%; and those who were persistent <80%. RA-related costs were compared between two groups. **RESULTS:** A total of 1242 patients were included, 339 patients (27.3%) with a persistency ratio <80% and 903 (72.7%) patients with a persistency ratio ≥80%. Over two-thirds of the patients were females and the mean age was 50 years. Other than pharmacy cost, higher persistence resulted in lower non-pharmacy medical costs ($3091 versus $4601). The higher persistence cohort had significantly lower cost in all non-pharmacy cost categories: inpatient services, physician services, other out-patient services, emergency room, and lab costs as compared to the lower persistence cohort. After adjusting for confounding variables (age, gender, co-morbidity, and disease staging), patients in the higher persistence group had a significant lower non-pharmacy cost with a lower co-morbidity. There was no difference in age, gender, and disease staging between the groups. **CONCLUSION:** This study indicates that while higher pharmacy costs were associated with

higher persistence, non-prescription medical costs were reduced for patients who were more persistent with anti-TNFs. Future analyses need to examine the influence of higher persistence on clinical outcomes.

AO3

PERSISTENT USE OF ANTIHYPERTENSIVE DRUGS LEADS TO A 1.5–2 TIMES INCREASED CHANCE OF BLOOD PRESSURE GOAL ATTAINMENT IN STAGE 2 ANTIHYPERTENSIVE PATIENTS

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OBJECTIVE: This study investigated the relationship between persistence with antihypertensive drugs (AHT) and blood pressure (BP) goal attainment in clinical practice. **METHODS:** From the PHARMO record linkage system comprising, among others, linked drug-dispensing and hospital records of >2 million inhabitants in The Netherlands, new users of AHT were identified in the period 1999–2004. Patients with stage 1 hypertension (systolic BP of 140–159 mmHg and/or diastolic BP of 90–99 mmHg) or stage 2 hypertension (systolic BP ≥160 and/or diastolic BP ≥ 100 mmHg) in the period of 6 months before onset of AHT treatment were included in the study. Only patients with a BP measurement in the period of 6–12 months after treatment onset were included in the final study cohort. Persistence with AHT was determined by summing the number of days of continuous treatment (gaps between dispensings <30 days) from treatment onset. The outcome of interest was the first BP measurement in the period of 6–12 months after start. Patients with a BP below 140/90 mmHg were defined "at goal". **RESULTS:** The study included 1271 patients of whom 1103 (87%) had stage 2 hypertension. About 36% of patients with stage 1 and 13% of patients with stage 2 hypertension were at goal at the time of the first BP measurement in the period of 6–12 months after treatment onset. Fifty-four percent of patients with stage 1 hypertension and 73% of patients with stage 2 hypertension were persistent with AHT at goal attainment. Persistent use of AHT was associated with a 1.7 times increased chance of BP goal attainment in stage 2 hypertensive patients (RRadj = 1.67; 95%CI: 1.13–2.46), but not in stage 1 hypertensive patients (RRadj = 1.04; 95%CI: 0.69–1.58). **CONCLUSION:** Persistent use of AHT plays an important role in BP goal attainment in clinical practice in stage 2 hypertensive patients.

AO4

ADHERENCE TO GASTROPROTECTION AND THE RISK OF NSAID-RELATED UPPER GASTROINTESTINAL COMPLICATIONS

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OBJECTIVES: To investigate the association between the level of adherence to GPAs and the risk of serious NSAID-related UGI complications in patients using non-selective NSAIDs (nsNSAIDS). **METHODS:** A population based nested case-control study was conducted within a cohort of new NSAID users with at least one risk factor for a NSAID-related UGI complication identified in the Dutch Integrated Primary Care Information database between 1996–2005. Adherence to GPAs was calculated as the proportion of NSAID treatment days covered (PDC) by a GPA prescription. Multivariate conditional logistic regression analysis was used to calculate adjusted odds ratios (OR) with 95% confidence intervals (95%CI). **RESULTS:** Considering the most recent episode of continuous nsNSAID use prior to the index date, 14.9% of the nsNSAID users received GPAs. Of these, 71.0% had a PDC ratio >80% (full adherence), 22.0% PDC ratios between 20–80% (partial adherence) and 7.0% being non-adherent (PDC < 20%). The risk of a serious NSAID-related UGI complication increased from 2.5 (95%CI: 1.0–6.7) in partially adherent persons to 4.0 (95%CI: 1.2–13.0) in those with a PDC < 20%. Considering the PDC level as a continuous measure, the risk of a serious NSAID-related UGI complication increased with 16% (95%CI: 2–32%) with every 10% decrease in adherence. Excluding H2RA users that were not adequately dosed for the prevention of NSAID-related UGI complications; the risk was increased 2.7-fold in patients that were partially adherent and 4.5-fold in patients that were non-adherent. **CONCLUSION:** There is a strong relationship between the level of adherence to gastroprotective medication and the risk of serious UGI complications in high-risk nsNSAID users. This underlines the need for adequate patient instruction regarding adherence to GPAs and/or the further development of fixed combination strategies.

PODIUM SESSION II: METHODS & CONCEPTS

MC1

METHODS OF MODEL CALIBRATION: A COMPARATIVE APPROACH

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OBJECTIVES: To compare results of alternative calibration methods using a global model of human papillomavirus and cervical cancer, adapted to the US setting. **METHODS:** We developed a mathematical model incorporating a Markov process simulating six-month transitions between health states of HPV-related cervical disease. We calibrated the model to primary endpoints, such as age-specific cervical cancer incidence and mortality, and further used mathematical algorithms to ensure model fits to age-specific prevalence of cervical intraepithelial lesions (CIN, grades 1–3). Calibration parameters consisted of age- and HPV type-specific transition probabilities, and data on US calibration targets and ranges for transition probabilities were obtained through an extensive review of the published literature. Three methods of calibration were sequentially used to calibrate the model: manual, random computer search, and Nelder-Mead computer optimization algorithm. Maximum likelihood estimation and weighted mean percentage deviation were used to evaluate the goodness-of-fit of each calibration, alternately. All calibration strategies were compared using percentage difference from the optimal goodness-of-fit score. **RESULTS:** The uncalibrated model deviated from the optimal fit by 62%, the manual calibration by 20%, the random search by 13%, and the Nelder-Mead optimization by 10% when using maximum likelihood as the goodness-of-fit criteria. When using weighted mean percentage deviation as the goodness-of-fit criteria, the corresponding percentages were 39% (uncalibrated), 19% (manual), 15% (random), and 11% (Nelder-Mead). Using weighted mean percentage deviation, when compared to maximum likelihood, as the goodness-of-fit criteria resulted in a closer fit to primary model endpoints, including cervical cancer incidence and mortality. **CONCLUSION:** Computerized methods of model calibration such as the Nelder-Mead optimization algorithm can substantially improve the predictive validity of a pharmacoeconomic model. Careful selection of the goodness-of-fit criteria is necessary to ensure that the model is calibrated according to research needs.